



The Dryden X-Press

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Cave detection

On Earth, the moon or Mars, technique could be used

By Beth Hagenauer
Dryden Public Affairs

As part of a study that could one day help determine whether there is life on Mars, a NASA aircraft recently collected thermal and visual imagery from high above California’s Mojave Desert through a NASA-funded airborne science mission.

The study is designed to aid in detection of caves on Earth, the moon and Mars.

“This is important because once we develop techniques for detecting caves on Earth, we can then apply these techniques to looking for caves on Mars,” said Judson “Jut” Wynne, a doctoral candidate at Northern Arizona University, Flagstaff, and a researcher at the SETI Institute.

Wynne, project manager of the



EC98 44816-4

NASA Photo by Lori Losey

The Beechcraft B-200 Super King Air No. 801 flies a mission.

study, said caves may be a source of shelter for astronauts establishing colonies in the harsh conditions of the moon and Mars, and are the best place to search for evidence of life on Mars.

A Dryden-based Beechcraft 200 King Air research aircraft flew two missions in April carrying NASA’s Quantum Well Infrared Photodetector, or QWIP, developed jointly with QmagiQ LLC of Nashua, N.H. The QWIP camera, operated by engineer Murzy Jhabvala of Goddard Space Flight Center in Greenbelt, Md., is based on detector technology that can “see” invisible infrared light in a range of wavelengths.

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CCPM is having a positive influence

By Jay Levine
X-Press Editor

Better communication, a 25 percent increase in the number of projects completed on an accelerated time schedule and a database that makes it possible to see the center’s progress at a glance are some early results of Dryden’s move to Critical Chain Project Management, said Tom Horn, who heads the CCPM effort.

A key step in Dryden’s move to



Tom Horn

for resource, project and center managers. It reflects all tasks and key milestones for active

projects and resources allocated for completing them on schedule.

Dryden’s main campus projects now are included in Concerto and work has begun on adding Dryden Aircraft Operation Facility projects. For example, the next major segment of the Stratospheric Observatory for Infrared Astronomy program, based at the DAOF in Palmdale, recently was added.

The move to CCPM and Concerto software is designed to

improve coordination of projects and resources center-wide as a means of meeting customer deadlines, decreasing employee stress and allocating time for research, training and planning. The next step is completing the task of adding the DAOF projects and keeping up with a number of new projects slated to start this summer, Horn said.

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Students design test stand

Key component for test stand designed and fabricated

By Jay Levine
X-Press Editor

Dryden tasked a group of college students from Lancaster with developing a plan for a test fixture for propeller and fan-driven components. A potential use for the fixture is in research on X-48 vehicle engines.

Dryden has a number of ties to the California State University-Fresno engineering program. In addition to funding the development of the plan as well as a key fixture component, a Dryden employee was taking a CSU-Fresno engineering course and the effort provided a way for him not only to incorporate the test project into his class but also allowed him to contribute to a NASA goal of supporting science, technology, engineering and mathematics, or STEM, education.

Aric Warner, a Dryden employee who previously worked in the machine shop, completed his engineering degree with the test fixture project. He was assigned as chief engineer for the project, which is not usually permitted, but because of his experience and knowledge, an exception was made. The class began with two teams working on the problem, but since the teams produced many of the same design ideas, it was decided to combine the teams’ ideas into a single design.

It was Warner’s talk with Dryden engineer Kurt Kloesel and X-48 project manager Tim Risch that provided the project’s genesis. It turned out that Dryden needed a stand for testing propeller and fan-driven components, and some funding existed for having students come up with ideas for the design and building a key subsystem before the end of the semester. Risch, Kloesel and Dryden researcher Jonathan Barraclough worked together on the details to make it happen.



ED11 0149-09

NASA Photo by Tom Tschida

Dryden and CSU-Fresno agreed that students would design a test stand and a major component during the semester. First row, from left, are Ronalynn Ramos, Shiamaa Aboutaleb, Robert Bernstein, Deleena Noble, Jeigh Shelley and Jonathan Barraclough. Second row, from left, are Ken Santarelli, Edgar Felix, Kyle Brunaeu, Aric Warner, Erik Waite, Jacob Billeter, Tim Risch and Kurt Kloesel.

“The best part, for me, is that this class is the first time in college where I have experienced a realistic project,” Warner said. “This work means something. Since I have experience in fabrication and projects at Dryden, this was beneficial because it focused on realistic design work and building a critical subsystem for a project.”

Course instructor Jeigh Shelley, who is currently on loan to CSU from the Air Force Research Laboratory at Edwards Air Force Base, said many of her students find jobs based on their class experiences. She also is helping to transition the engineering program from CSU-Fresno to an even more ambitious CSU-Long Beach program that is

getting under way. Classes begin in the fall.

Partnering with area community colleges, the program takes students who have completed their sophomore years and are ready for junior- and senior-level engineering courses, Shelley said. The class requires them to work on a project, such as the test fixture, for a practical look at how to apply what they have learned.

“The class saw this project all the way through to testing, and saw the result of what they made. It is a confidence-building experience. There are no easy answers, or answers in the back of the book. They had to struggle and go through the design process

and deliver the intangibles, such as giving the customer what he wanted.

“This group demonstrated all of the aspects of the process and listened to the customer, and I have confidence recommending any one of them for a job,” Shelley said.

Risch commissioned the work.

“I think the students did an excellent job,” he said. “Their innovation and design met the requirements. Students bring fresh and innovative ways of looking at problems – idea generation and creativity in solving problems is what students offer.”

A key component of the engineering program is developing

See Students, page 6

Imaging volcanoes

JPL UAVSAR used on seven flights

By Emily Schaller
National Suborbital Education and
Research Center
NASA Airborne Science Program

A NASA Gulfstream III aircraft returned to base at the Dryden Aircraft Operations Facility in Palmdale, Calif., May 10 after a successful nine-day mission to the Big Island of Hawaii. The mission’s goal was to image volcanoes on the Big Island and map surface deformations on the islands of Oahu, Molokai and Maui using the Uninhabited Aerial Vehicle Synthetic Aperture Radar, or UAVSAR, developed by the Jet Propulsion Laboratory in Pasadena, Calif. Seven science flights totaling 39.3 hours were flown during the deployment.

“These repeat-data acquisitions will allow us to image Kilauea’s surface displacement from the March 2011 fissure eruption, along the east rift zone of the volcano, in unprecedented resolution,” said Paul Lundgren, JPL principal



ED07 0044-05

NASA Photo by Lori Losey

The JPL synthetic aperture radar pod is visible beneath the Gulfstream III.

investigator for the study.

Plans call for return missions at yearly intervals, sooner should significant new eruptive activity occur. The UAVSAR provides unique data that can improve

scientists’ understanding of eruption-source processes. Data collected this year will provide a basis for comparison with future missions flown in response to new or impending volcanic eruptions.

Air Force officials seek Dryden RAB volunteer

Edwards Air Force Base Environmental Management officials need a volunteer to represent the NASA employee community on the base Restoration Advisory Board. The board provides a forum for the exchange of information among members of the public, base restoration officials and state and federal regulators.

People from on- and off-base communities represent their respective community on the board, which meets biannually to discuss the progress of the base cleanup program.

Applicants need not have environmental expertise, but should

be accessible within the NASA area and willing to publicize contact information. Applications are available from the Environmental Management customer service desk (5 E. Popson Ave.) or online at <https://eafb.mojavedata.gov:10429/Public%20Documents/Forms/AllItems.aspx> (click on RAB application, updated September 2008).

The current deadline for applications is June 20, though the deadline may be extended until the position is filled. For additional information contact Gary Hatch, Edwards Public Affairs, at 661-277-4127, 95abw.pae@edwards.af.mil.

News

at NASA

OCT solicits services

NASA is seeking proposals for services from commercial suborbital flight providers and payload integrators to support the agency’s Flight Opportunities Program, an initiative of the Office of the Chief Technologist.

Contracts will be awarded to multiple vendors capable of providing payload integration and flight services on commercial suborbital reusable launch vehicles. The flights will carry a variety of payloads to help meet the agency’s technology and innovation goals, enabling future missions and benefiting America’s commercial aerospace industries.

“Partnering with U.S. suborbital reusable launch vehicle providers for integration of technology payloads and launch services is an effective way to use the innovations of American industry while meeting the technology development needs of the nation’s space program,” said Chief Technologist Bobby Braun.

The OCT was established with the goal of bringing new technologies to flight-readiness status for future space missions. As part of this strategy, NASA will provide frequent flight opportunities for payloads on suborbital reusable launch vehicles capable of flying to various altitudes, including above 62 miles, but not reaching low-Earth orbit.

Each successful vendor will receive an indefinite-delivery,

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June 21, 1962 – During preflight checks, a ground crewman wrote in the frost on the X-15 fuselage: “250,000 or no ice cream.” Bob White flew X-15 (56-6672) to 246,700 feet that day.

June 29, 1967 – Maj. William J. “Pete” Knight made an emergency landing at Mud Lake, Nev., in X-15-1 (56-6670) following a total electrical power failure.

June 13, 2003 – The B-52H (61-0025) flew with an all-Dryden crew for the first time.

Safety is everyone's responsibility

Event aims to curb increasing number of injuries at Dryden

By Jay Levine

X-Press Editor

In a trend Dryden officials want to reverse, more people are getting hurt at Dryden this year than last.

A May 25 Safety Day event brought together the center's workforce, presented reminders about how to be safe and asked everyone to take responsibility for safety at work and at home.

"I think it's important, [Safety and Mission Assurance director] Vince Chacon thinks it's important, and [Center Director] David McBride thinks it's important. Safety doesn't just happen. You have to consciously think about it all the time," said Pat Stoliker, Dryden deputy director.

In an effort to "make safety a part of everything we do," Stoliker said employee performance plans will include a safety element concerning required training and timely reporting of potential safety hazards.

An emphasis also has been placed on resolving reported safety issues. There were more than 800 open tickets in March for correction of safety hazards, a number that a lot of hard work has reduced to 365 items, Stoliker said.

By July 4, McBride wants that number further reduced to fewer than 320 outstanding reports, but Stoliker challenged employees to bring that number to less than 300. Dryden employees can help by fixing some of the more common, and easy to fix, potential dangers in their own work areas, he said.

Three common safety violations people can handle on their own including replacing defective power strips, ensuring appliances are plugged directly into an outlet rather than a power strip and eliminating daisy chains, where a number of cords are plugged into the same outlet with power strips and extension cords. (See lead photo for a full list of Dryden's top 10 safety violations.)

McBride's safety message

Although McBride was unable to attend the event, he stressed the need to work safely in a written message to Dryden employees.

"This is one day during the year where we dedicate time to our workforce to step back and reflect on their work environment. It represents our commitment to ensuring Dryden employees have all the necessary training and tools to safely accomplish the Dryden mission," McBride wrote.

Flight research requires even more attention to detail than do other workplaces, as there is greater risk involved in removing technology barriers.

"It is the nature of flight research to contain an element of risk. But we must push past the limits of the known to discover the unknown. These risks are accompanied by potential consequences that can be costly, including, but not limited to, loss of assets and loss of life.

"It is hoped that today's activities will serve as a reminder to remain diligent in applying these hard-learned safety practices to our flight activities. There will always be risks in what we do, but we can make a difference in the outcome so that we don't have to explain to the taxpayers, or to the families of our coworkers and friends, what went wrong."

McBride wrote that anyone can stop an unsafe operation and has a responsibility to say so if they see something unsafe. "Safety needs to be at the very core of how we live, work and play. Dryden's mission success



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NASA Photo by Tom Tschida

depends on you," McBride's message concluded.

Although most of the event was focused on specific areas of safety, there were moments of levity thanks to the comedic duo of Mack Dryden and Jamie Alcroft. The two had commentary on Dryden culture along with skits and songs.

Dryden impressed them: "Most places ignore our request for at least one F/A-18 to be present," Alcroft quipped.

When things don't go right

The event was the first since McBride asked a different Dryden code to lead Safety Day every six months in an attempt to involve more and more people in aspects of Dryden's safety. Research and Engineering, or Code R, presented the event, which was called "Flight Safety is Everyone's Responsibility."

The need for safety and the results of what happens when something goes wrong are at the top of Brad Flick's mind. Flick, Dryden's Research

and Engineering director, has traveled from coast to coast as the chairman of the mishap investigation into the March 4 loss of Orbital Sciences' Taurus XL rocket.

The rocket, launched from Vandenberg Air Force Base, Calif., failed to reach orbit and crashed in the southern Pacific Ocean. It was carrying NASA's Glory Earth-observing satellite that was intended to improve understanding of how the sun and tiny atmospheric particles called aerosols affect Earth's climate.

To complicate matters, what happened to the rocket is similar to what happened with NASA's Orbiting Carbon Observatory launched on a previous Taurus XL mission from Vandenberg in 2009. In both cases, the fairing, a protective shell over the satellite, did not separate as expected.

Although the investigation is ongoing, Flick said the same configuration was used on both launches and lessons will be learned from the loss. One thing that the investigation so far has made clear is that everyone was trying to do his or her best, he said.



ED11 0158-57

NASA Photo by Tom Tschida

At left, Deputy Center Director Pat Stoliker tells Dryden employees that more people are being injured on the job and everyone has responsibility for safety. In addition, he discussed the top 10 safety risks at the center. *Above*, comedy duo Mack Dryden, right, and Jamie Alcroft helped lighten the mood with song, skits and observations on Dryden culture.

Humans are fallible, and that's why Dryden's system of checks and balances is so important to successful projects. "If something doesn't look right, say so," he said. In addition, Flick said one way to think about a potential concern is to "make sure the work can hold up to a mishap investigation board."

Human error

Humans do make mistakes, a fact that Joe Nieberding stressed in his presentation about lessons learned from space system development.

Nieberding, who had a 32-year NASA career at Glenn Research Center in Cleveland, including serving as center director from 1990-1994, now is president of Aerospace Engineering Associates of Cleveland. Nieberding has over 42 years of management and technical experience in leading and serving on NASA independent review teams, and in evaluating NASA advanced space mission planning.

Of 39 investigations in which he has had a role, 38 had some component of human error associated with the failure. On only one occasion was the failure the result of hardware, he said. More striking is the fact that "we are still making the mistakes of 50 years ago."

However, Nieberding put that in perspective, noting that 95 percent of launches worldwide are successful. For the rest, there are a number of contributing factors, from design errors and systems engineering to process breakdowns and software or political factors.

Much can be learned from near misses as well as from accidents, he said. A design error made shuttle mission STS-51 a near miss. Damage to orbiter, tiles and blanket could have resulted in catastrophic consequences, such as the loss of the orbiter.

Amped-up sonic booms may lead to quieter supersonic aircraft design

By **Gray Creech**
Dryden Public Affairs

In an ironic twist, NASA is using supersonic aircraft to produce amped-up, super-loud sonic booms in an effort to understand how to minimize their startling impact and design quiet supersonic aircraft.

“The ultimate goal is to allow supersonic transportation over land,” said Edward Haering, principal investigator for the Superboom Caustic Analysis and Measurement Program, or SCAMP, now under way at Dryden. Researchers recently employed a two-mile-long string of microphones to record the thunder of an accelerating F/A-18 jet for the project.

When a supersonic aircraft accelerates to its cruise speed, a focusing effect occurs that makes the sonic boom five to 10 times louder than its normal cruise sonic boom over a small region,” said Haering. “This effect is similar to how light rays are focused by a lens.”

The focused booms are being measured to help ensure that tomorrow’s supersonic jets are quiet in all phases of flight, including acceleration.

The measurements will be used to validate computer prediction tools that will be used in the design of quiet supersonic aircraft. If the predictive tools can accurately mirror the louder-than-normal booms generated through SCAMP research, then engineers will



ED11 0150-115

NASA Photo by Tom Tschida

A Dryden F/A-18 prepares for a SCAMP research flight.

have confidence that they are capturing the proper acoustics and aerodynamics effects, which then can be used with confidence to guide the design of supersonic aircraft with sonic booms at unprecedented low decibel levels.

The primary ground microphone array was nearly two miles long and consisted of a straight row of 81 microphones set 125 feet apart along an east-west dirt road. An Edwards Air Force Base staff biologist with experience working in desert environments helped keep the project’s sensor locations away from sensitive species.

Airborne microphones were mounted on a Dryden TG-14 motorized glider also outfitted with

sound recording equipment. The test bed flew between the booming F/A-18 jet and the ground at altitudes of from 4,000 to 10,000 feet to record the SCAMP booms. Additionally, a 35-foot-long blimp was tethered at 3,500 feet above ground with two microphones along its tether.

The flights were flown in the remote Black Mountain Supersonic Corridor north of Boron, Calif., in restricted military testing airspace near Edwards, where supersonic flight is permitted. Researchers went to great lengths to keep the SCAMP sonic booms away from populated areas.

The complex effort involved multiple partners, including

Dryden, Langley Research Center in Virginia, Wyle Laboratories, The Boeing Company, Northrop Grumman, Cessna, Gulfstream, Central Washington University, Pennsylvania State University, Eagle Engineering, MetroLaser Inc., and Seismic Warning Systems Inc.

“It was operationally complex, given the number of team members, and logistically complicated, given the remote location of the microphone array, the unpaved roads leading to the site, and the communication among all the players, assets and the control room at Dryden, which is about an hour-and-a-half drive away” said Dryden’s SCAMP project manager, Tom Jones.

“However, given the challenges, the SCAMP team worked together to gather one of the most interesting sets of supersonic flight research data the supersonic community has seen in some time,” said Jones. “The data represent 13 flights that generated 70 sonic-boom events.”

Generating high levels of sonic boom noise in order to learn how to quiet it may seem counterintuitive, but the research is proving effective in helping engineers understand what must be done to design low-sonic-boom-producing aircraft.

The SCAMP was funded through NASA’s Aeronautics Research Mission Directorate and managed by the Supersonics Project in the directorate’s Fundamental Aeronautics Program.

Students... from page 2

local talent for the needs of the Antelope Valley aerospace community. For that reason, a large number of graduates from the engineering program find work in the field, Shelley said.

Deleena Noble, who lives in the Antelope Valley, hopes that’s how this class ends – with finding a job.

Noble has made the most of

opportunities. She is graduating from this program with an engineering degree and has participated in NASA student summer programs for the past two years.

“The internships at NASA and this program gave me experience that should help me find work after graduation. The experiences

give me the confidence that I can succeed in aerospace engineering, or, hopefully, space-related work,” she said.

Information on the program is available at <http://www.ccpe.edu/> Engineering, or from the CSU-LB College of Continuing Professional Education customer service center, 800-963-2250.

Dryden picnic set for July 30

The Dryden summer picnic will be held July 30 at Central Park in Tehachapi. Tickets will be on sale June 1-July 20 in the gift shop, \$10 per person ages six years and older. Children five and under are free. This year’s event will have a carnival theme.

Responsibility... from page 5

In that mishap a payload was to be separated from the orbiter, but wiring for the pyrotechnics had not been correctly connected, causing explosions on the top and the bottom of the structure carrying the payload. A short video clip of the accident shot from the shuttle showed debris following the payload out of the orbiter.

Another lesson is to remember that because something worked today, that doesn't mean it will work tomorrow. There are often advanced warnings that something is going to happen and breaking the chain of events to prevent failure is where the emphasis needs to be, he said.

Using a heritage system – a system qualified and proven in one usage – for another use without adequate testing in the new application is a common mistake, Nieberding said. Heritage items should be approached as if they are brand new – because they were not intended for the new usage. The European Arienne V, which required the entire Arienne IV software package as developed, resulted in a failure, he added.

Concerning political pressure, Nieberding cited an Oct. 24, 1960, incident in which a Russian intercontinental ballistic missile test became the largest disaster in Russian rocketry history. Pressure to launch was excessive because the launch date coincided with a historical milestone. The rocket's second stage ignited before the first stage and caused the death of more than 120 people when it exploded into a series of fireballs.

Nieberding suggested a number of ways to reduce some of the symptoms that led to those accidents. A system to reward people for finding problems, capturing knowledge and documents, and continuously applying "sanity checks" are some of the answers.

Testing also is key, because it can produce "unexpected and unwanted results" that are better off being identified before a system fails. Validating with ground tests before flight, as is common at Dryden, is another good way to weed problems from systems.

Developing a mishap

It is often mentioned that an accident is a chain of events that can be broken with vigilance.

That was the theme of a presentation by Steve Jensen, Stratospheric Observatory for Infrared Astronomy chief engineer. Jensen used the example of a fictitious flight of the King Air flying with an electronics box on board for flight research.

He illustrated through a faux chief engineer's entries in a diary how things can start off with good intentions but quickly become complex. Hindsight is 20/20, but cost and schedule pressures can lead to the wrong conditions for work on a project.

"It's not a single event, it's a chain that starts to build up. Somebody didn't do something, or somebody missed something," he said.

That's also true of smaller projects, like the one in his scenario. "Dryden is big and busy and sometimes we view small projects as having no risk, rather than low risk."

Recognizing trouble areas was not a problem for the Dryden audience, but that was the start, he said. The point was that procedures need to be followed, new people need to be trained, and people need to think about why they are doing what they are doing and for what purpose.

"Are we asking the right questions?" Jensen asked.

A cautionary tale

Boeing's Jonathan Vass said accidents happen, but an experimental X-48 engine surprised the team when the test stand it was on wasn't tied down and the vibrations caused it to tip over.

No one was injured, but things easily could have turned out differently, he said.

Some lessons learned to reinforce include not changing procedures on the fly, making sure new people are up to speed on procedures, and not using equipment for unintended purposes without prior validation, he said.

Flightline safety

Safety is important in every area of Dryden, but few places pose the life-threatening dangers of the hangars and flightline, said Nick Kiriokos, aviation ground safety officer.

People without specific tasks should not be in the hangar or on the flightline, but people who are allowed to be there may not approach an aircraft without the crew chief's permission.

"Airplanes are temperamental beasts that can bite. You have to know what you are doing around aircraft," he said.

Hazardous chemicals and fuels are used. There are toxins, exhaust plumes, noise and numerous tripping hazards, and feet are always in danger because of the potential for falling objects, he added. For that reason, sandals and high heel shoes are an absolute no-no.

Allowing unauthorized people in aircraft areas also increases the danger of foreign object debris, or FOD, which is anything other than air that can be sucked up into an aircraft inlet and potentially causing engine damage.

Every moment counts

Safety in project management is key to mission success, but when a person requires cardiopulmonary resuscitation, it's an immediate matter of life and death.

That's the message from Tom Stafford, a Los Angeles Fire Department captain and paramedic. When a person is suffering from cardiac arrest, every minute that no one acts reduces their likelihood of survival by 10 percent.

By the time 9-1-1 is called and emergency responders are on scene, eight minutes may have elapsed. If there is no one to administer at least cardiopulmonary resuscitation, than the person's chance of survival is a slim 20 percent.

For that reason, he asked people to update their CPR training and use it. Also, Dryden has a number of automated external defibrillators around the center. Those devices are easy to use and have audio instructions. The machine will determine whether a shock is needed. Using the device could make the difference in whether a person lives or dies in an emergency.

Regardless of whether a situation is life threatening, Dryden officials want center employees to look out for each other and do all they can to make the center a safer place. In addition, Dryden officials want employees to use their heads wherever they are – work, home or play – and be safe doing it.



Nick Kiriokos



Steve Jensen

CCPM... from page 1

Documenting projects in Concerto brings challenges to the surface sooner, he said. An immediate payoff is improved communication, which has led to resolving problems on the spot that would not have been easily identified as quickly in the past, he added.

For example, it was determined that a \$1,500 transducer was holding up a project as a result of a budgeting issue that arose prior to approval of the current fiscal year budget and during the continuing resolution, Horn said. The issue was quickly resolved once the impediment was identified in a center work-review meeting.

Along those lines, the new processes showed that additional funds were needed for the F/A-18 No. 853 phase maintenance. The challenge is not yet resolved, but since it was identified, Horn said

center managers are seeking a solution.

It will take an entire fiscal year to fully implement and assess the results of CCPM and Concerto, he said, but preliminary assessments are encouraging. Because information is updated frequently and housed in a single database, project managers and center officials can always be on top of the latest developments.

“Instead of just fighting fires, we are looking for the ignition sources and eliminating those,” Horn said.

When a major challenge is identified as a result of changing requirements, networks can be modified and updated and then reposted to the Concerto database. Some items, such as aircraft maintenance, have yet to be networked and added into Concerto.

“We do not have enough capacity to tackle it all at once, but we are chipping away at it,” he said.

The data in the Concerto system will help center officials determine the root causes of project delays and the solutions to eliminate them. Enough data have already been collected in the Concerto system to allow managers to identify challenges in allocating staff to priority projects as a main source of delay in completing projects. Staffing to priorities and remaining flexible are key components of keeping project schedules on track, Horn said. A secondary concern in keeping schedules is when vendors and partners are unable to deliver a component or resource required to complete the project when it is needed.

“We’re still running late on some projects, as would be expected this early in a new process. On the targets we have set, we are completing milestones at a completion rate that is 25 percent better than last year. There still is a large tidal wave of work for the next six to 12 months that we are committed to,” Horn said.

As the previously agreed-to projects are completed and new projects are accepted under the new system, Horn believes the numbers will improve even more. Another area he expects will improve is an area called reinvestment. That includes items such as basic research to validate a new technology, paper writing and training.

“We knew that getting significant

reinvestment time was going to be hard because of the number of projects we had already accepted. Also, there is no mechanism for tracking reinvestment hours in the timekeeping systems. However, papers are included in project planning, and we are keeping track of those,” Horn said.

CCPM is a methodology and management structure designed to enable users to reach milestones on schedule and efficiently distribute resources. The Concerto database synchronizes and integrates the projects, to minimize constraints.

CCPM is based on the theory of constraints, the concept that a system can work only as safely and with as much momentum as allowed by the most constrained component, such as a machine, aircraft or staff.

For more information, or to ask questions, go to the Xnet CCPM website at <http://Xnet/DrydenManagement/CCPM/index.html>.

Plans... from page 3

indefinite-quantity contract. This request for proposals is a continuation of efforts aligned with the NASA Authorization Act of 2010, with funding provided by the fiscal year 2011 Continuing Resolution.

The Flight Opportunities Program is managed at Dryden. For more information about the request for proposals, visit <http://go.usa.gov/rlq>.

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